

Computer Applications, Advanced

(COMP APP ADV)

4528

Computer Applications, Advanced is a business course that integrates computer technology, decision-making, and problem-solving skills. Areas of instruction include advanced applications and integration of a professional software suite and the use of emerging technology. Students should be given the opportunity to seek business/industry certification, such as Microsoft Office Specialist (MOS) certification. Instructional strategies may include collaborative instruction, peer teaching, in-baskets, minibaskets, LAPs, school and community projects, and a school-based enterprise.

- Recommended Grade Level: 10-12
- Required Prerequisite: Computer Applications
- Credits: A one- or two-credit course over one or two semesters
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Course content standards/performance expectations and Indiana Academic Standards integrated at: <http://www.doe.in.gov/octe/bme/curriculum/contentstandards.htm>
- Teacher Requirements: <http://doe.in.gov/dps/licensing/assignmentcode>
- Career Clusters: This course may be included as a component for career pathways in all Indiana career clusters
- Career pathway information: <http://www.doe.in.gov/octe/facs/CrrClstrGrid.html>

Course Content Standards and Performance Expectations

CAA 1 Technology Operation and Conceptualization Skills

CAA 1.1 Content Standard: Students demonstrate a comprehensive understanding of the interactivity and operation of technology systems.

Performance Expectations

- CAA 1.1.1** Select and demonstrate use of industry-standard hardware and emerging technology to complete any given task including academic work, i.e. scanners, digital cameras, digital camcorders, CD/DVDs, keyboard, touch screen, stylus, speech, and handhelds.
- CAA 1.1.2** Select appropriate software for the support of content area learning such as sound, graphic, video, current industry-standard applications and suites/operating systems.
- CAA 1.1.3** Use the operating system to compress, zip/unzip, and backup files to a hard drive, other drives, or a server.
- CAA 1.1.4** Demonstrate the ability to follow instructions (instructor, text, manuals, help/on-line help, and/or screen).
- CAA 1.1.5** Compare and contrast the functional relationship between basic hardware and software systems and their components.
- CAA 1.1.6** Apply the organizational concept behind using files and folders for storing information and organizing files into folders.
- CAA 1.1.7** Demonstrate saving, opening, and finding files using a variety of different formats.
- CAA 1.1.8** Compare and contrast the use of and the difference between temporary memory (RAM), permanent memory (ROM), and storage (e.g., digital storage on hard, floppy, and zip disks; flash drives; and optical storage-- CD/DVD).
- CAA 1.1.9** Compare and contrast the many types of technologies used in society.

CAA 2 Social, Ethical, and Human Issues of Technology

CAA 2.1 Content Standard: Students understand and apply the social, legal, and ethical issues related to technology use in personal and professional endeavors.

Performance Expectations

- CAA 2.1.1** Practice respectful and responsible use of technology through abiding by the professional practices.
- CAA 2.1.2** Apply the ability to work independently and as a team member (includes efficient use of time, organization of work, etc.).
- CAA 2.1.3** Apply an understanding of plagiarism and fair use; respect copyright laws of information producers such as authors and artists, including website developers. Apply an understanding of the interaction and interdependence between humans and technology.
- CAA 2.1.4** Apply an understanding of the interaction and interdependence between humans and technology.
- CAA 2.1.5** Analyze how changes in technology affect the workplace and society.

CAA 3 Technology as a Productivity Tool

CAA 3.1 Content Standard: Students apply technology as a means to create business, industry, and professional tasks.

Performance Expectations

- CAA 3.1.1** Apply a variety of input technology tools, i.e., speech recognition, hand-writing recognition, and keying.
- CAA 3.1.2** Apply appropriate handling and use of supplies and equipment.
- CAA 3.1.3** Apply appropriate use of editing tools to meet industry standards.
- CAA 3.1.4** Design hyperlinks between files, sections, programs, and web pages.
- CAA 3.1.5** Plan time lines to complete tasks in allotted time.
- CAA 3.1.6** Save different tasks as a Web Page.
- CAA 3.1.7** Integrate different file types.
- CAA 3.1.8** Attach digital signatures to documents.

CAA 3.2 Content Standard: Students use word processing software to create, edit, and publish industry appropriate documents.

Performance Expectations

- CAA 3.2.1** Apply advanced word-processing skills by creating a variety of business and technical documents, i.e., newsletters with mast heads, multi-column brochures, multi-page books, forms, using wizards, templates, or composition.
- CAA 3.2.2** Apply word-processing formatting skills, i.e., styles, table of contents.
- CAA 3.2.3** Apply word-processing skills by accessing and editing documents, including the effective use of editing commands, i.e. dividing page, making sections.
- CAA 3.2.4** Apply advanced word-processing skills in the creation of drawing tables, outlines, mail merge, creating styles and using go to.
- CAA 3.2.5** Apply table of contents and indexes to reports.
- CAA 3.2.6** Apply word-processing graphic object skills such watermarks, editing clipart, 3-D, grouping/ungrouping.
- CAA 3.2.7** Apply special features and tools such as protect document, tracking changes, templates, auto text, auto correct.
- CAA 3.2.8** Apply the ability to format a variety of documents that meet employability standards.
- CAA 3.2.9** Create, Modify, and distribute forms using various form controls.

- CAA 3.2.10** Create, edit and run macros.
- CAA 3.2.11** Create and manage master documents and subdocuments.
- CAA 3.2.12** Create cross references.

CAA 3.3 Content Standard: Students use spreadsheet software to create, edit, analyze, and publish industry appropriate files.

Performance Expectations

- CAA 3.3.1** Use industry terminology when using spreadsheet software.
- CAA 3.3.2** Create and evaluate formulas, and functions.
- CAA 3.3.3** Create customize formats.
- CAA 3.3.4** Create, edit and apply templates.
- CAA 3.3.5** Link and consolidate data using 3-D references (create workspaces).
- CAA 3.3.6** Create, name, copy, clear, and move ranges.
- CAA 3.3.7** Add group and outline criteria to ranges.
- CAA 3.3.8** Analyze and select spreadsheet advanced formatting features such as conditional formatting, filtering, and protection.
- CAA 3.3.9** Apply relative, absolute, and mixed cell references in formulas.
- CAA 3.3.10** Copy, move, and verify accuracy of formulas.
- CAA 3.3.11** Create effective charts or graphs which represent relevant data most effectively.
- CAA 3.3.12** Edit and label chart components such as axis, legends, titles, datatables.
- CAA 3.3.13** Apply advanced features such as naming ranges and using range names in formulas and printing.
- CAA 3.3.14** Utilize goal seek and auditing tools, i.e. track, accept, and reject changes.
- CAA 3.3.15** Create pivot tables and charts.
- CAA 3.3.16** Create, edit, and run command buttons, macros, and macros with buttons.
- CAA 3.3.17** Utilize database functions i.e. filtering and extracting.
- CAA 3.3.18** Create Extensible Markup Language (XML) Web queries.
- CAA 3.3.19** Import and export data to and from spreadsheet.
- CAA 3.3.20** Link and merge worksheets/workbooks.
- CAA 3.3.21** Embed numbers.

CAA 3.4 Content Standard: Students use database software to create, edit, analyze, and publish industry appropriate files.

Performance Expectations

- CAA 3.4.1** Use terminology associated with database.
- CAA 3.4.2** Plan, create, and modify multiple database tables in different views.
- CAA 3.4.3** Utilize advanced property features such as input mask and lookup.
- CAA 3.4.4** Import/export data to a new table or database or other software.
- CAA 3.4.5** Compact, repair and encrypt/decrypt database.
- CAA 3.4.6** Design, create, and modify data forms utilizing advanced features i.e. subforms.
- CAA 3.4.7** Create Combo boxes.
- CAA 3.4.8** Create and use macros and switchboards.
- CAA 3.4.9** Use and understand database splitter.
- CAA 3.4.10** Demonstrate report creation that involves: summary options, calculated controls, and sub reports.
- CAA 3.4.11** Create and use queries to specify criteria such as calculated fields, group data, action queries (update and delete data), parameter query, Pivot tables, pivot charts, aggregate functions and concatenation.
- CAA 3.4.12** Create a database using multiple tables to establish relationship(s) between tables, referential integrity.

CAA 3.5 Content Standard: Students use presentation software to create, edit, analyze, and publish industry appropriate files.

Performance Expectations

- CAA 3.5.1** Apply industry standards in creating and presenting all presentations.
 - CAA 3.5.2** Apply advanced presentation software skills by creating, accessing/retrieving, saving, and printing files.
 - CAA 3.5.3** Use views appropriately to create and manipulate presentations—normal, outline, notes, slide sorter view.
 - CAA 3.5.4** Analyze situations and create a customized handout.
 - CAA 3.5.5** Use Industry design guidelines to enhance visual presentations.
 - CAA 3.5.6** Create a presentation with *video*, embedded objects, specialized features i.e. action buttons, links, hyperlinks, record narration, on-line broadcast, and create a design template.
 - CAA 3.5.7** Import relevant data from word processing, spreadsheet, database, and other presentation files.
 - CAA 3.5.8** Create a summary slide.
 - CAA 3.5.9** Create a stand-alone version for a CD/DVD (package for CD/DVD).
 - CAA 3.5.10** Modify and design templates—master slide, master title slide, master notes, with customized header/footer.
 - CAA 3.5.11** Embed logos or objects for exact placement.
 - CAA 3.5.12** Create an autorun looping presentation.
 - CAA 3.5.13** Demonstrate presentation skills by creating well-organized, audience-appropriate presentations such as informative, entertaining, instructional, using proper public speaking techniques.
- CAA 3.6 Content Standard:** Students will integrate files within an industry-standard software suite.

Performance Expectations

- CAA 3.6.1** Demonstrate the ability to select appropriate software for completing a variety of projects.

CAA 4 Technology as a Communication Tool

- CAA 4.1 Content Standard:** Students use telecommunications to collaborate, publish, and interact with peers, teachers, experts, and other audiences.

Performance Expectations

- CAA 4.1.1** Use telecommunications skills by collaborating and communicating effectively (using e-mail, e-learning, video conferencing, instant messaging, chat, blogs, newsgroups, net meetings, etc.) with peers, experts, teachers, and other audiences.
- CAA 4.1.2** Use appropriate technology to plan, develop, edit and present material to different types of audiences (i.e., paper, web page, multimedia presentation, publications, speech, hypermedia, etc.).

CAA 5 Technology as an Information Research Tool

- CAA 5.1 Content Standard:** Students use technology to access, review, evaluate, and select information from multiple resources for reporting purposes.

Performance Expectations

- CAA 5.1.1** Evaluate and select appropriate sources of information (i.e., print, video, electronic, and human) for a specific research problem or question.
- CAA 5.1.2** Use advanced searching Technique using Internet/intranet search engines, directories, biographical dictionaries and thesaurus.
- CAA 5.1.3** Evaluate and select several resources from a variety of information sources by reviewing each author's credentials, perspective, or bias; validate the accuracy of information based on multiple audiences.
- CAA 5.1.4** Use portable document software to read and create pdf files for the web.

CAA 6 Technology as a Problem-Solving and Data-Driven Decision-Making Tool

- CAA 6.1 Content Standard:** Students use technology to develop strategies for solving problems.

Performance Expectations

- CAA 6.1.1** Integrate technology to solve problems and make informed decisions.
- CAA 6.1.2** Analyze a problem from different perspectives using appropriate tools (e.g., spreadsheets, databases).
- CAA 6.1.3** Integrate information and communication technology to analyze a real-world problem, design and implement procedures to monitor information, set timelines, and evaluate progress toward the solution.

CAA 7 Technology as an Assessment Tool

- CAA 7.1 Content Standard:** Students use technology to take developmentally appropriate tests utilizing audio and/or visual feedback when necessary.

Performance Expectations

- CAA 7.1.1** Take computer-adaptive timed multiple-choice or true/false tests.
- CAA 7.1.2** Take computer-based narrative tests.
- CAA 7.1.3** Take computer-based tests for topic remediation and support, and use feedback appropriately for self-assessment.

Indiana Academic Standards

Integrated into Computer Applications, Advanced

English/Language Arts

Standard 1

READING: Word Recognition, Fluency, and Vocabulary Development

10.1.1 Understand technical vocabulary in subject area reading.

Standard 2

READING: Comprehension (Focus on Informational Materials)

Structural Features of Informational and Technical Materials

10.2.3 Demonstrate use of sophisticated technology by following technical directions.

Standard 4

WRITING: Process

Organization and Focus

10.4.1 Discuss ideas for writing with classmates, teachers, and other writers and develop drafts alone and collaboratively.

10.4.4 Use clear research questions and suitable research methods, including texts, electronic resources, and personal interviews, to compile and present evidence from primary and secondary print or Internet sources.

10.4.7 Integrate quotations and citations into a written text while maintaining the flow of ideas.

10.4.8 Use appropriate conventions for documentation in text, notes, and bibliographies following the formats in different style manuals.

10.4.9 Use a computer to design and publish documents by using advanced publishing software and graphic programs.

10.4.10 Review, evaluate, revise, edit, and proofread writing using an editing checklist.

10.4.11 Apply criteria developed by self and others to evaluate the mechanics and content of writing.

10.4.12 Provide constructive criticism to other writers with suggestions for improving organization, tone, style, clarity, and focus; edit and revise in response to peer reviews of own work.

11.4.1 Discuss ideas for writing with classmates, teachers, and other writers.

11.4.4 Structure ideas and arguments in a sustained and persuasive way and support them with precise and relevant examples.

11.4.9 Use a computer to integrate databases, pictures and graphics, and spreadsheets into word-processed documents.

11.4.10 Review, evaluate, and revise writing for meaning, clarity, achievement of purpose, and mechanics.

11.4.11 Edit and proofread one's own writing, as well as that of others, using an editing checklist.

11.4.12 Revise text to highlight the individual voice, improve sentence variety and style, and enhance subtlety of meaning and tone in ways that are consistent with the purpose, audience, and form of writing.

12.4.1 Engage in conversations with peers and the teacher to plan writing, to evaluate how well writing achieves its purposes, and to explain personal reaction to the task.

12.4.4 Structure ideas and arguments in a sustained and persuasive way and support them with precise and relevant examples.

12.4.6 Use language in creative and vivid ways to establish a specific tone.

12.4.7 Develop presentations using clear research questions and creative and critical research strategies, such as conducting field studies, interviews, and experiments; researching oral histories; and using Internet sources.

- 12.4.9 Use technology for all aspects of creating, revising, editing, and publishing.
- 12.4.11 Revise, edit, and proofread one's own writing, as well as that of others, using an editing checklists.
- 12.4.12 Further develop unique writing style and voice, improve sentence variety, and enhance subtlety of meaning and tone in ways that are consistent with the purpose, audience, and form of writing.

Standard 5

WRITING: Applications (Different Types of Writing and Their Characteristics)

10.5.5 Write business letters that:

- provide clear and purposeful information and address the intended audience appropriately.
- show appropriate use of vocabulary, tone, and style that takes into account the intended audience's knowledge about and interest in the topic and the nature of the audience's relationship to the writer.
- emphasize main ideas or images.
- follow a conventional style with page formats, fonts (typeface), and spacing that contribute to the documents' readability and impact.

10.5.7 Use varied and expanded vocabulary, appropriate for specific forms and topics.

10.5.8 Write for different purposes and audiences, adjusting tone, style, and voice as appropriate.

11.5.6 Use varied and extended vocabulary, appropriate for specific forms and topics.

11.5.7 Use precise technical or scientific language when appropriate for topic and audience.

11.5.8 Deliver multimedia presentations that:

- Combine text, images, and sound and draw information from many sources, including television broadcasts, videos, films, newspapers, magazines, CD-ROMs, the Internet, and electronic media-generated images.
- Select an appropriate medium for each element of the presentation.
- Use the selected media skillfully, editing appropriately, and monitoring for quality.
- Test the audience's response and revise the presentation accordingly.

12.5.5 Write job applications and resumes that:

- Provide clear and purposeful information and address the intended audience appropriately.
- Use varied levels, patterns, and types of language to achieve intended effects and aid comprehension.
- Modify the tone to fit the purpose and audience.
- Follow the conventional style for that type of document (a resume or cover letter of application) and use page formats, fonts (typeface), and spacing that contribute to the readability and impact of the document.

12.5.6 Use varied and extended vocabulary, appropriate for specific forms and topics.

12.5.7 Use precise technical or scientific language when appropriate for topic and audience.

12.5.8 Deliver multimedia presentations that:

- Combine text, images, and sound and draw information from many sources, including television broadcasts, videos, films, newspapers, magazines, CD-ROMs, the Internet, and electronic media-generated images.
- Select an appropriate medium for each element of the presentation.
- Use the selected media skillfully, editing appropriately, and monitoring for quality.
- Test the audience's response and revise the presentation accordingly.

Standard 6

WRITING: English Language Conventions

Manuscript Form

- 10.6.3 Produce legible work that shows accurate spelling and correct use of the conventions of punctuation and capitalization.
- 10.6.4 Apply appropriate manuscript conventions — including title page presentation, pagination, spacing, and margins — and integration of source and support material by citing sources within the text, using direct quotations, and paraphrasing.
- 11.6.1 Demonstrate control of grammar, diction, paragraph and sentence structure, and an understanding of English usage.
- 11.6.2 Produce writing that shows accurate spelling and correct punctuation and capitalization.
- 11.6.3 Apply appropriate manuscript conventions in writing—including title page, presentation, pagination, spacing, and margins—and integration of source and support material by citing sources within the text, using direct quotations, and paraphrasing.
- 12.6.1 Demonstrate control of grammar, diction, and paragraph and sentence structure, as well as an understanding of English usage.
- 12.6.2 Produce writing that shows accurate spelling and correct punctuation and capitalization.
- 12.6.3 Apply appropriate manuscript conventions in writing—including title page presentation, pagination, spacing, and margins—and integration of source and support material by citing sources within the text, using direct quotations, and paraphrasing.

Standard 7

LISTENING AND SPEAKING: Skills, Strategies, and Applications

Organization and Delivery of Oral Communication

- 10.7.4 Use props, visual aids, graphs, and electronic media to enhance the appeal and accuracy of presentations.
- 10.7.5 Produce concise notes for extemporaneous speeches (speeches delivered without a planned script).
- 10.7.6 Analyze the occasion and the interests of the audience and choose effective verbal and nonverbal techniques (including voice, gestures, and eye contact) for presentations.
- 10.7.10 Assess how language and delivery affect the mood and tone of the oral communication and make an impact on the audience.
- 10.7.11 Evaluate the clarity, quality, effectiveness, and general coherence of a speaker's important points, arguments, evidence, organization of ideas, delivery, choice of words, and use of language.
- 11.7.8 Evaluate when to use different kinds of effects (including visuals, music, sound, and graphics) to create effective productions.
- 12.7.6 Use effective and interesting language, including informal expressions for effect, Standard English for clarity, and technical language for specificity.
- 12.7.7 Use research and analysis to justify strategies for gesture, movement, and vocalization, including pronunciation, enunciation, and the use of dialect.
- 12.7.8 Evaluate when to use different kinds of effects (including visuals, music, sound, and graphics) to create effective productions.
- 12.7.12 Critique a speaker's use of words and language in relation to the purpose of an oral communication and the impact the words may have on the audience.
- 12.7.19 Deliver multimedia presentations that:
 - Combine text, images, and sound by incorporating information from a wide range of media, including films, newspapers, magazines, CD-ROMs, online information, television, videos, and electronic media-generated images.
 - Select an appropriate medium for each element of the presentation.
 - Use the selected media skillfully, editing appropriately and monitoring for quality.

- Test the audience's response and revise the presentation accordingly.

Algebra I

Standard 2

Linear Equations and Inequalities

A1.2.6 Solve word problems that involve linear equations, formulas, and inequalities.

Standard 3

Relations and Functions

A1.3.2 Interpret a graph representing a given situation.

A1.3.3 Understand the concept of a function, decide if a given relation is a function, and link equations to functions.

Standard 9

Mathematical Reasoning and Problem Solving

A1.9.1 Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.

A1.9.2 Decide whether a solution is reasonable in the context of the original situation.

A1.9.3 Use the properties of the real number system and the order of operations to justify the steps of simplifying functions and solving equations.

Discrete Mathematics

Standard 2

Students use matrices

DM.2.1 Use matrices to organize and store data.

DM.2.2 Use matrix operations to solve problems.

Standard 4

Students use graph theory techniques.

DM.4.5 Use bin-packing techniques to solve problems.

Standard 5

Students use the mathematics of social choice.

DM.5.1 Use election theory techniques to analyze election data.

Probability and Statistics

Standard 1

Descriptive Statistics

PS.1.1 Create, compare, and evaluate different graphic displays of the same data, using histograms, frequency polygons, cumulative frequency distribution functions, pie charts, scatterplots, stem-and-leaf plots, and box-and-whisker plots. Draw these by hand or use a computer spreadsheet program.

PS.1.2 Compute and use mean, median, mode, weighted mean, geometric mean, harmonic mean, range, quartiles, variance, and standard deviation.

The National Educational Technology Standards (NETS) Integrated into Computer Applications, Advanced

Technology Foundation Standards for Students

1. Basic operations and concepts
 - Students demonstrate a sound understanding of the nature and operation of technology systems.
 - Students are proficient in the use of technology.
2. Social, ethical, and human issues
 - Students understand the ethical, cultural, and societal issues related to technology.
 - Students practice responsible use of technology systems, information, and software.
 - Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
3. Technology productivity tools
 - Students use technology tools to enhance learning, increase productivity, and promote creativity.
 - Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.
4. Technology communications tools
 - Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
 - Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
5. Technology research tools
 - Students use technology to locate, evaluate, and collect information from a variety of sources.
 - Students use technology tools to process data and report results.
 - Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.
6. Technology problem-solving and decision-making tools
 - Students use technology resources for solving problems and making informed decisions.
 - Students employ technology in the development of strategies for solving problems in the real world.